APPENDIX F:

BIOLOGICAL ASSESSMENT FOR THE BANGOR HYDRO-ELECTRIC COMPANY NORTHEAST RELIABILITY INTERCONNECT

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F.1 INTRODUCTION

Executive Order (E.O.) 10485 (September 9, 1953), as amended by E.O. 12038 (February 7, 1978), requires that a Presidential permit be issued by the U.S. Department of Energy (DOE) before electric transmission facilities may be constructed, operated, maintained, or connected at the U.S. international border. Bangor Hydro-Electric Company (BHE) has applied to DOE to amend Presidential Permit PP-89, which authorizes BHE to construct a single-circuit, 345,000-volt (345-kV) alternating-current (AC) electric transmission line across the U.S. international border in the vicinity of Baileyville, Maine.

The proposed transmission line, referred to as the Northeast Reliability Interconnect (NRI), would originate at the existing Orrington Substation, located in Orrington, Maine, and extend eastward to the international border between the United States and Canada, where it would connect with a transmission line to be constructed, operated, and maintained by New Brunswick Power Corporation (NB Power) (Figure F-1). DOE has determined that an amendment to the Presidential permit would constitute a major Federal action that may have a significant impact on the environment within the meaning of the National Environmental Policy Act of 1969 (NEPA).

In response to DOE's November 2, 2004, notice in the *Federal Register* (Volume 69, page 63514 [69 FR 63514]) requesting scoping comments on the preparation of an environmental impact statement (EIS) to discuss the impacts of BHE's proposed project, the U.S. Fish and Wildlife Service (USFWS) sent a letter dated December 1, 2004 (Bartlett 2004), that provided the USFWS response pursuant to Section 7 of the Endangered Species Act (ESA), as amended (*United States Code*, Title 16, Sections 1531–1543 [16 USC §§ 1531–1543). In that letter, the USFWS identified two Federally listed species known to occur in the project area: the threatened bald eagle (*Haliaeetus leucocephalus*) and the endangered Atlantic salmon (*Salmo salar*).

This biological assessment, prepared as required under Section 7 of the ESA, discusses the presence of, and assesses potential project-related impacts on, the bald eagle and the Gulf of Maine distinct population segment (DPS) of the Atlantic salmon in the vicinities of the proposed route for the NRI. Under the ESA, three types of effects determinations are possible:

- No effect — This determination means that the project would have no effects, positive or negative, on a species.

- May affect, but not likely to adversely affect — This determination means that all impacts would be beneficial, insignificant, or discountable. Such a determination would require concurrence from the USFWS.

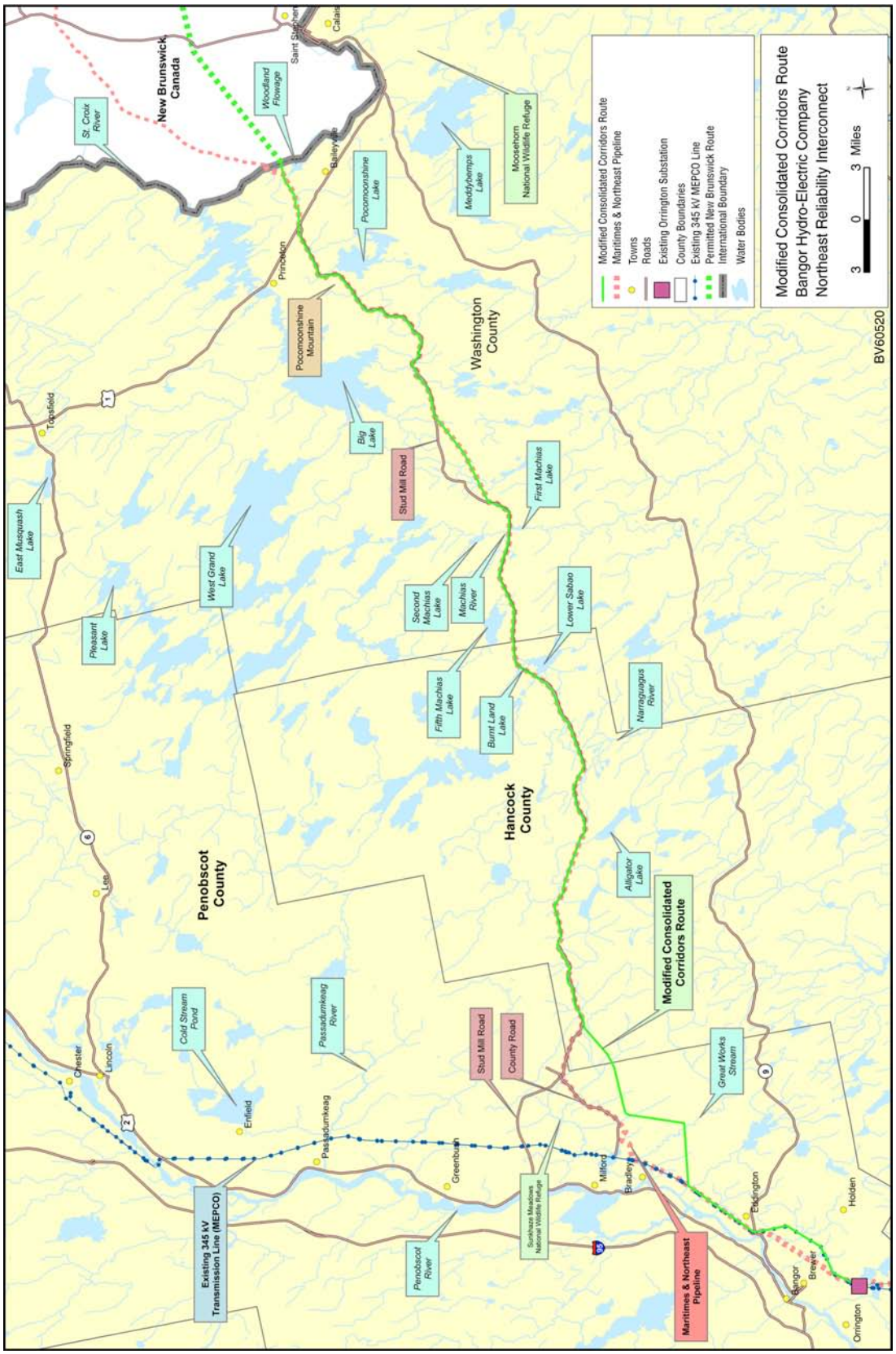

FIGURE F-1 Modified Consolidated Corridors Proposed Route for the Bangor Hydro-Electric Company Northeast Reliability Interconnect (Source: Paquette 2005a)

- May affect, likely to adversely affect — This determination means that there would be at least one adverse effect of the proposed action on a species and that formal consultation, as defined in the ESA, would be required with the USFWS.

F.2 PROPOSED ACTION

The proposed Federal action is to determine whether it is in the public interest to grant an amendment to Presidential Permit PP-89 to BHE for the construction, operation, maintenance, and connection of the proposed NRI 345-kV transmission line. BHE's stated purposes for the NRI are to improve the reliability and stability of the bulk electric transmission system, increase the import/export transmission capacity between Maine and New Brunswick, and reduce costly line losses (BHE 2005). The applicant's stated purposes would be achieved by constructing, operating, and maintaining the NRI. Details on the project purposes and description are provided in Chapters 1 and 2 of this EIS.

F.3 TRANSMISSION LINE DESCRIPTION

The proposed (preferred) route, referred to as the Modified Consolidated Corridors Route, is shown in Figure F-1. From the Orrington Substation, the Modified Consolidated Corridors Route would parallel the existing 345-kV Maine Electric Power Company (MEPCO) transmission line to Blackman Stream in the Township of Bradley. The Modified Consolidated Corridors Route would then proceed east-northeast, generally paralleling the Maritimes & Northeast Pipeline, L.L.C. (M&N) gas pipeline and Stud Mill Road to the international border near Baileyville, Maine. The total distance of the Modified Consolidated Corridors Route would be about 85 mi (137 km).

The NRI would have a single-circuit configuration and would consist of two overhead shield wires and three phases with two conductors per phase. The 491 tangent structures would be wood-pole H-frame structures, while the 117 angle and dead-end support structures would consist of 110 three-pole wood structures and 7 three-pole steel structures. Average span length would be 731 ft (223 m). Minimum sag clearance to vegetation would be 15.0 ft (4.6 m) (TRC 2005a).

The width of the right-of-way (ROW) for the NRI would be 170 ft (52 m) for a new ROW (18% of the route), 155 ft (47 m) where it would be co-located with the M&N gas pipeline and/or Stud Mill Road (68% of the route), 100 ft (30 m) where it would be co-located with an existing transmission line (6% of the route), and 125 ft (38 m) where it would be co-located with the M&N gas pipeline and an existing transmission line (8% of the route). Where the NRI would parallel, cross, or otherwise be located near the M&N gas pipeline, AC mitigation would be required for the pipeline. The mitigation techniques under consideration include the installation of a zinc ribbon buried about 18 in. (46 cm) deep that would overlay the pipeline, and the use of coiled zinc ribbon ground mats at existing test stations along the pipeline. However, the zinc ribbon and the test station mats would not be required within stream crossings.

F.4 ENVIRONMENTAL SETTING

F.4.1 Terrestrial Resources

About 17.7 million acres (7.2 million ha), or 90%, of Maine is forest land. The forest land is a mixture of softwoods and hardwoods (LURC 1997). Maine is situated in an ecological transitional zone between the eastern boreal and the temperate deciduous forests. Spruce-fir is the most prevalent forest type, accounting for 42% of Maine's forest land. Most of Maine's forests are naturally regenerated stands that are managed extensively. Approximately 562,000 acres (227,000 ha) are harvested annually, with harvesting rotation intervals of 20 to 60 years (McWilliams et al. 2005). Within Hancock, Penobscot, and Washington Counties, nearly 4.5 million acres (1.8 million ha) are forested, and less than 400,000 acres (161,875 ha) are nonforest lands (McWilliams et al. 2005).

General vegetative cover types that occur in the project area include early successional and clear-cut areas, spruce-fir forests, white-pine/mixed-hardwood forests, forested wetlands, scrub-shrub wetlands, and emergent wetlands (TRC 2002). Early successional habitats found throughout the project area include fallow fields, hayfields, and other agricultural lands and existing ROWs (e.g., for transmission lines and gas pipelines). These areas are frequently disturbed by tilling, harvesting, and/or maintenance practices for vegetation.

The proposed route crosses primarily privately owned managed forests consisting of recent clear-cuts, young second- and third-growth stands, and older managed stands. Consequently, ongoing forestry practices have affected, and will continue to affect, the character of this landscape. The area within which the proposed route occurs consists of a mosaic of forest types dominated by spruce-fir, northern hardwoods, aspen-beech, and white-pine/red-pine.

At least a quarter of the land area in Maine (more than 5 million acres [2 million ha]) is wetlands (Maine State Planning Office 2001). Wetland types within the project area include palustrine emergent, open water, scrub-shrub, and forested. These wetlands include inland marshes, wet meadows, peatlands, shrub swamps, forested swamps (both deciduous and evergreen), forested floodplain wetlands, and vernal pools (MDEP 2005). Riverine wetlands are common within the channels of water bodies. The NRI ROW would cross 188 wetlands for a total distance of about 7.7 mi (12.4 km). About 133 acres (54 ha) of the ROW would be wetlands, including 70 acres (28 ha) of forested wetlands.

The general types of land cover within the ROW for the proposed route would be 1,411 acres (571 ha) of forests (including forested wetlands), 31 acres (13 ha) of agricultural lands, and 125 acres (51 ha) of other land cover (including urban or built-up lands, residential and industrial areas, and roads) (BHE 2005). Significant wildlife habitats that occur within the project area are shown in Figure B.1-1 (Appendix B of the EIS). These include habitats for Federally or State listed threatened and endangered species, deer wintering areas, and waterfowl and wading bird habitats. Early successional habitat (grasses and forbs) occur over the M&N gas pipeline ROW. The NRI would parallel the pipeline for 58 mi (93 km).

A large diversity of wildlife species occurs in the project area because of the variety of habitat types present. Included are at least 45 species of mammals, 150 species of birds, and 25 species of reptiles and amphibians. Nearly 200 species of birds have been reported on or near the Sunkhaze Meadows National Wildlife Refuge (USFWS 2000). Numerous game species are actively managed by the Maine Department of Inland Fisheries and Wildlife (MDIFW). These species include black bear (*Ursus americanus*), moose (*Alces alces*), white-tailed deer (*Odocoileus virginianus*), various furbearing mammals, upland gamebirds, and waterfowl (MDIFW 2004). The NRI ROW would encompass about 133 acres (54 ha) of waterfowl and wading bird habitats (BHE 2005).

F.4.2 Aquatic Resources

The project area has extensive surface water resources. The NRI would have numerous stream and river crossings that would include portions of the Penobscot rivershed; the North Coastal rivershed, which includes the Union River, Narraguagus River, Machias River, and East Machias River subbasins; and the St. Croix rivershed. The proposed route would have a total of 117 stream and river crossings, which would include smaller intermittent and permanent streams (BHE 2005). The highest quality (Class AA[1]) streams and rivers that would be crossed by the proposed route are Baker Brook, Little Birch Stream, Birch Stream, unnamed tributary to Little Birch Stream, Titcomb Brook, unnamed tributary to Birch Stream, Sunkhaze Stream, unnamed tributary to Sunkhaze Stream, Wiley Brook, unnamed tributary to Indian Brook, Narraguagus River, and Machias River. The Narraguagus and Machias Rivers are also classified as Outstanding River Segments because of their unparalleled natural and recreational values that provide irreplaceable social and economic benefits.

Potential threats to water quality in the project area include all-terrain vehicle (ATV) use, roads (including logging, blueberry farm, state, and town roads), sand and salt facilities, peat and timber harvesting, faulty septic systems, phosphorous and other nutrients, pesticide drift and runoff, agricultural water withdrawal, beaver activity, acid precipitation, and landfill seepage and runoff. The potential environmental consequences of these threats can include sedimentation, loss of riparian vegetation, loss of aquatic habitat, alterations of water chemistry, increases in toxins, nutrient loading, loss of fish passage, and thermal stress (Arter 2003). Soil erosion is the primary source of pollution to surface waters in Maine (MDEP 2004).

More than 60 fish species have been reported from Maine. Both warmwater and coldwater species, including several migratory species, occur in the project area (Table F-1).

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1 Class AA is the highest classification for rivers and streams and applies to waters that are outstanding natural resources and that should be preserved because of their ecological, social, scenic, or recreational importance. Class AA waters must be of a quality that is suitable for use as drinking water after disinfection; for use in fishing, agriculture, recreation in and on the water, and navigation; and for use as habitat for fish and other aquatic life. The habitat must be characterized as free flowing and natural.

TABLE F-1 Representative Fish Species That Could Occur in the Project Area

Warmwater Species	Coldwater and Migratory Species
Chain pickerel (*Esox niger*)	American eel (*Anguilla rostrata*)[a]
Muskellunge (*Esox masquinongy*)	Alewife (*Alosa pseudoharengus*)[a]
Northern pike (*Esox lucius*)	American shad (*Alosa sapidissima*)[a]
Golden shiner (*Notemigonus crysoleucas*)	Blueback herring (*Alosa aestivalis*)[a]
Common shiner (*Luxilus cornutus*)	Brook trout (*Salvelinus fontinalis*)
Creek chub (*Semotilus atromaculatus*)	Brown trout (*Salmo trutta*)
Brown bullhead (*Ameiurus nebulosus*)	Lake trout (*Salvelinus namaycush*)
Banded killifish (*Fundulus diaphanus*)	Atlantic salmon (*Salmo salar*)[a]
Threespine stickleback (*Gasterosteus aculeatus*)	Landlocked salmon (*Salmo salar*)
Ninespine stickleback (*Pungitius pungitius*)	Lake whitefish (*Coregonus clupeaformis*)
White perch (*Morone americana*)	Round whitefish (*Prosopium cylindraceum*)
Largemouth bass (*Micropterus salmoides*)	Burbot (*Lota lota*)
Smallmouth bass (*Micropterus dolomieu*)	Blacknose dace (*Rhinichthys atratulus*)
Black crappie (*Pomoxis nigromaculatus*)	Longnose dace (*Rhinichthys cataractae*)
Redbreast sunfish (*Lepomis auritus*)	Longnose sucker (*Catostomus catostomus*)
Pumpkinseed (*Lepomis gibbosus*)	White sucker (*Catostomus commersoni*)
Yellow perch (*Perca flavescens*)	

[a] Migratory species.

Source: TRC (2002).

F.5 EVALUATION OF THREATENED AND ENDANGERED SPECIES

The USFWS (Bartlett 2004) identified the bald eagle and Atlantic salmon as occurring within the vicinity of the proposed NRI. The bald eagle is currently listed as threatened by the USFWS. The Atlantic salmon is jointly listed by the USFWS and the National Oceanic and Atmospheric Administration National Marine Fisheries Service (NOAA Fisheries) as endangered.

F.5.1 Bald Eagle (*Haliaeetus leucocephalus*)

The bald eagle was listed as Federally endangered on February 14, 1978 (USFWS 1978), and was reclassified as threatened effective August 11, 1995 (USFWS 1995). This raptor inhabits much of North America from the Arctic to the Gulf of Mexico. Populations of this once-common species declined beginning in the mid-1800s because of such factors as habitat loss and fragmentation, hunting, and (after World War II) contamination of prey with pesticides. As the bald eagle nears recovery in Maine, loss of undisturbed nesting sites is still one of the primary dangers to the state's eagle population. In recent years, polychlorinated biphenyls (PCBs), dioxin, and mercury also have affected bald eagles in Maine (USFWS 1999). Generally,

nesting pairs in Maine have been steadily increasing since 1990, when 123 breeding pairs occurred in the state. In 2003, there were 309 breeding pairs in Maine (USFWS 2004). Currently, about 62% of the state's bald eagle population occurs within Hancock, Penobscot, and Washington Counties (MDIFW 2002).

Adequate numbers of young eagles must be produced to achieve a lasting recovery for this species. Therefore, the designation of nest sites as "Essential Habitat" remains an important tool in achieving full recovery (MDIFW 2003). The applicant's proposed project requires an evaluation by the MDIFW to demonstrate that the project would not significantly alter Essential Habitat or violate protection guidelines adopted for the habitat. Evaluation criteria could include timing restrictions on the project (e.g., no construction near Essential Habitat during the critical nesting period). As is discussed below, the proposed route for the NRI would not be located within 0.25 mi (0.4 km) of a designated bald eagle nest.

Bald eagles prefer habitat along coastlines, lakes, rivers, and other water bodies that provide their primary food source — fish and waterfowl (NatureServe 2005). In interior Maine, the brown bullhead (*Ameiurus nebulosus*), white sucker (*Catostomus commersoni*), and chain pickerel (*Esox niger*) accounted for 84% of the fish and 64% of all food remains observed at bald eagle nests. Salmon and trout, while common throughout the state, were rarely used by eagles (Todd et al. 1982). Bald eagle nests are usually located within 0.5 mi (0.8 km) of water and in the tallest trees in a forest stand. Bald eagles also use perch and roost trees, which are also typically among the tallest trees in a forest stand. The perch trees are usually located within 165 ft (50 m) of water (Stalmaster 1987). Isolation from human disturbance may be an additional habitat need (DeGraaf and Rudis 1986). The hunting area or home range patrolled by a bald eagle varies from 1,700 to 10,000 acres (688 to 4,047 ha), while the nesting territory is about 640 to 1,280 acres (259 to 518 ha) (Baldeagleinfo.com 2001). In Oregon, productivity of bald eagle nesting was negatively correlated with proximity to clear-cuts and main logging roads (Anthony and Isaacs 1989). Bald eagles are known in the area around the proposed NRI; however, there are no known nests whose 0.5-mi-diameter (0.8-km-diameter) buffer zone intersects the proposed ROW. Figures F-2 through F-4 show the locations of known nests closest to the ROW.

Two nests are located along the Penobscot River near South Brewer (Figure F-2). The NRI would be located about 2,400 ft (732 m) from the edge of the 0.25-mi (0.4-km) buffer for the closer of the two nests and about 900 ft (274 m) from the Penobscot River. No other foraging areas (waterfowl and wading bird habitats) occur near the NRI in this area. Two more bald eagle nest sites are located at Alligator Lake (Figure F-3). The NRI would be more than 3,200 ft (975 m) from the edge of the closest 0.5-mi (0.8-mi) buffer. Several waterfowl and wading bird habitats are located within about 1,600 ft (487 m) or less of the NRI in this area, but Alligator Lake, Rift Pond, and King Pond are the only large water bodies in the area. All three water bodies are located on the same side of the ROW; thus, bald eagles would not be expected to make frequent flights across the ROW in this area while foraging.

A bald eagle nest is also located on Pocomoonshine Lake, and another one is on Dog Brook, a tributary to Pocomoonshine Lake (Figure F-4). The edge of the buffer for the

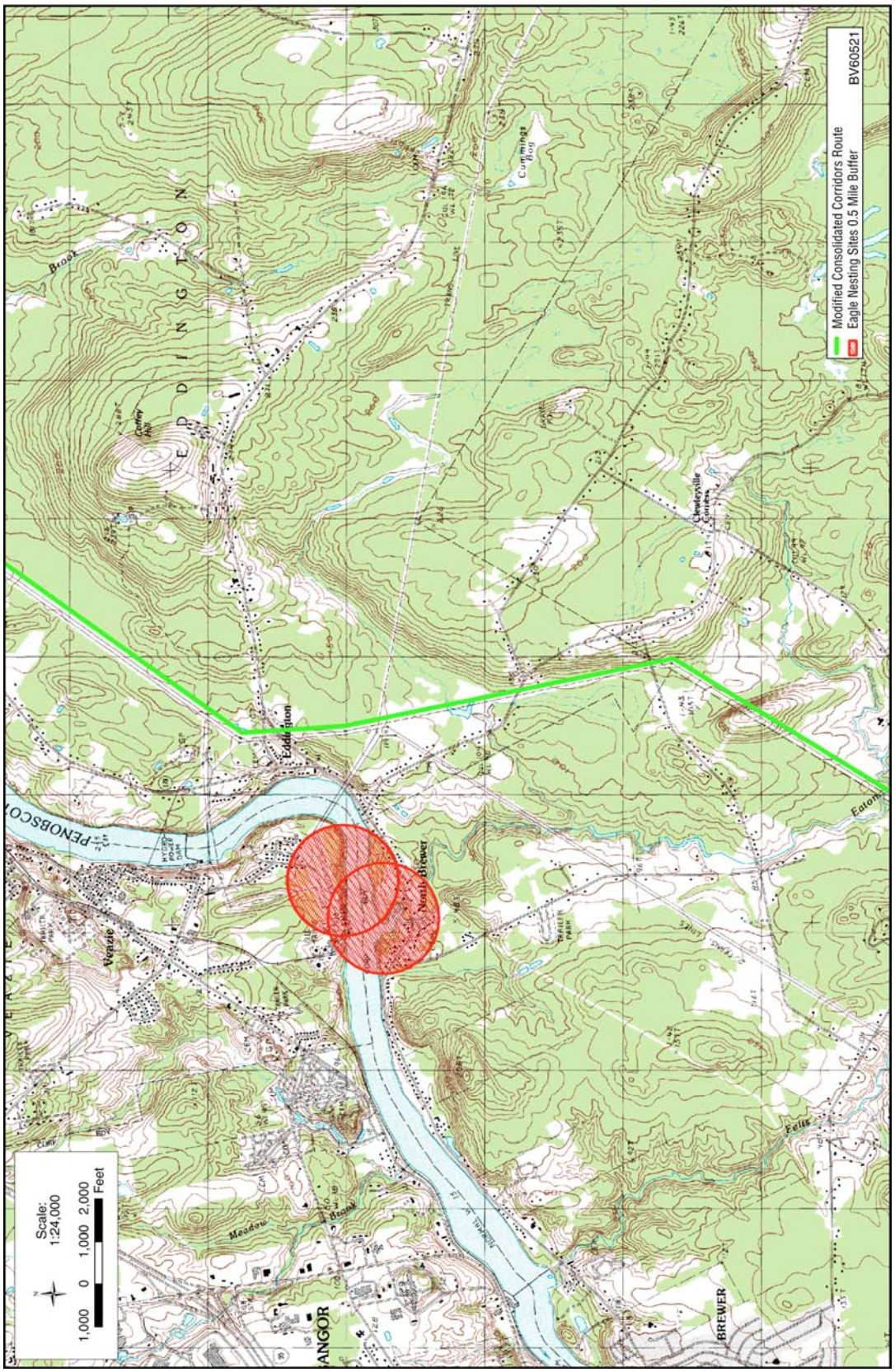

FIGURE F-2 Bald Eagle Nest Sites along the Penobscot River near the Modified Consolidated Corridors Route for the Bangor Hydro-Electric Company Northeast Reliability Interconnect (Source: Paquette 2005b)

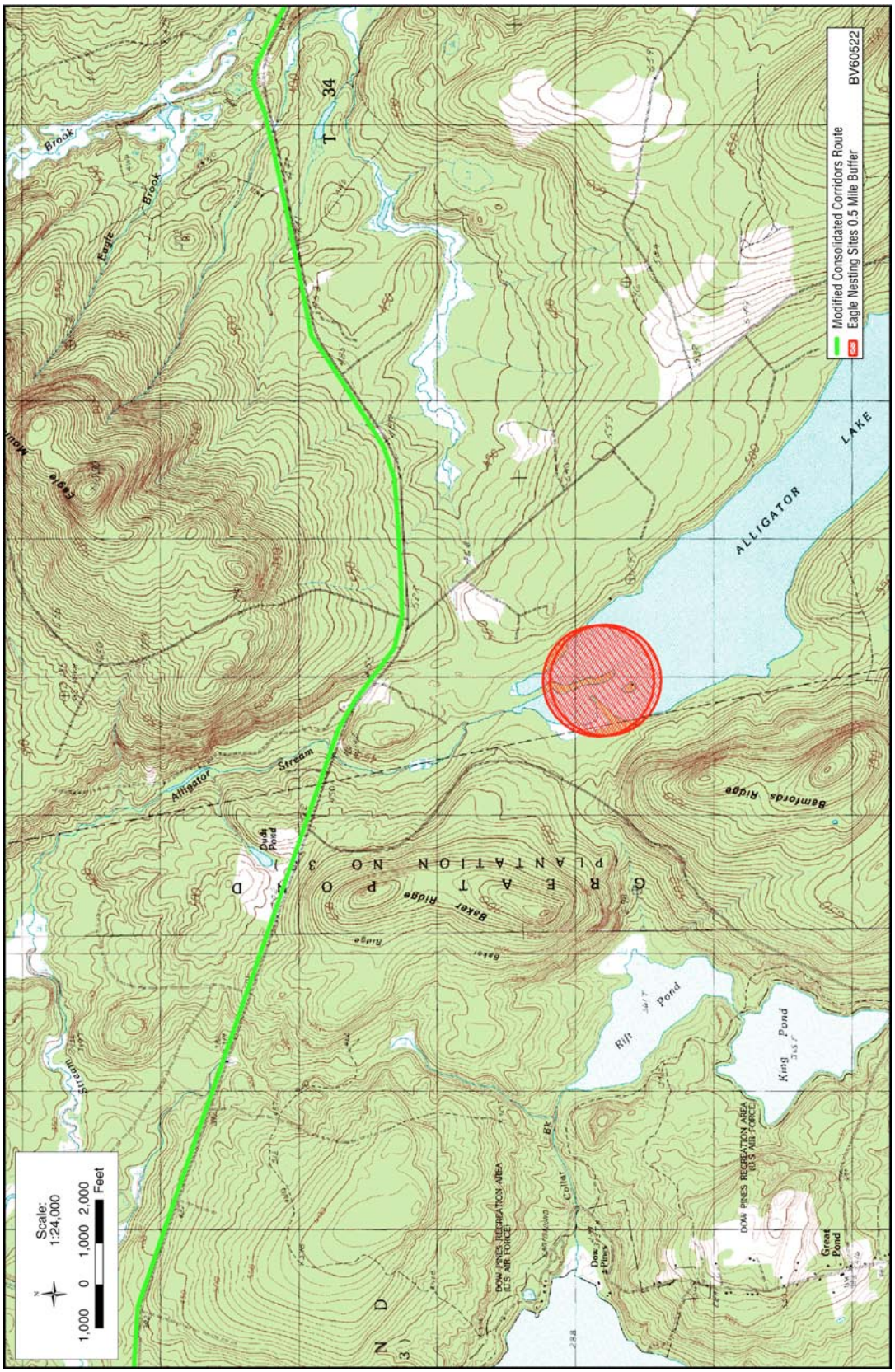

FIGURE F-3 Bald Eagle Nest Sites at Alligator Lake near the Modified Consolidated Corridors Route for the Bangor Hydro-Electric Company Northeast Reliability Interconnect (Source: Paquette 2005b)

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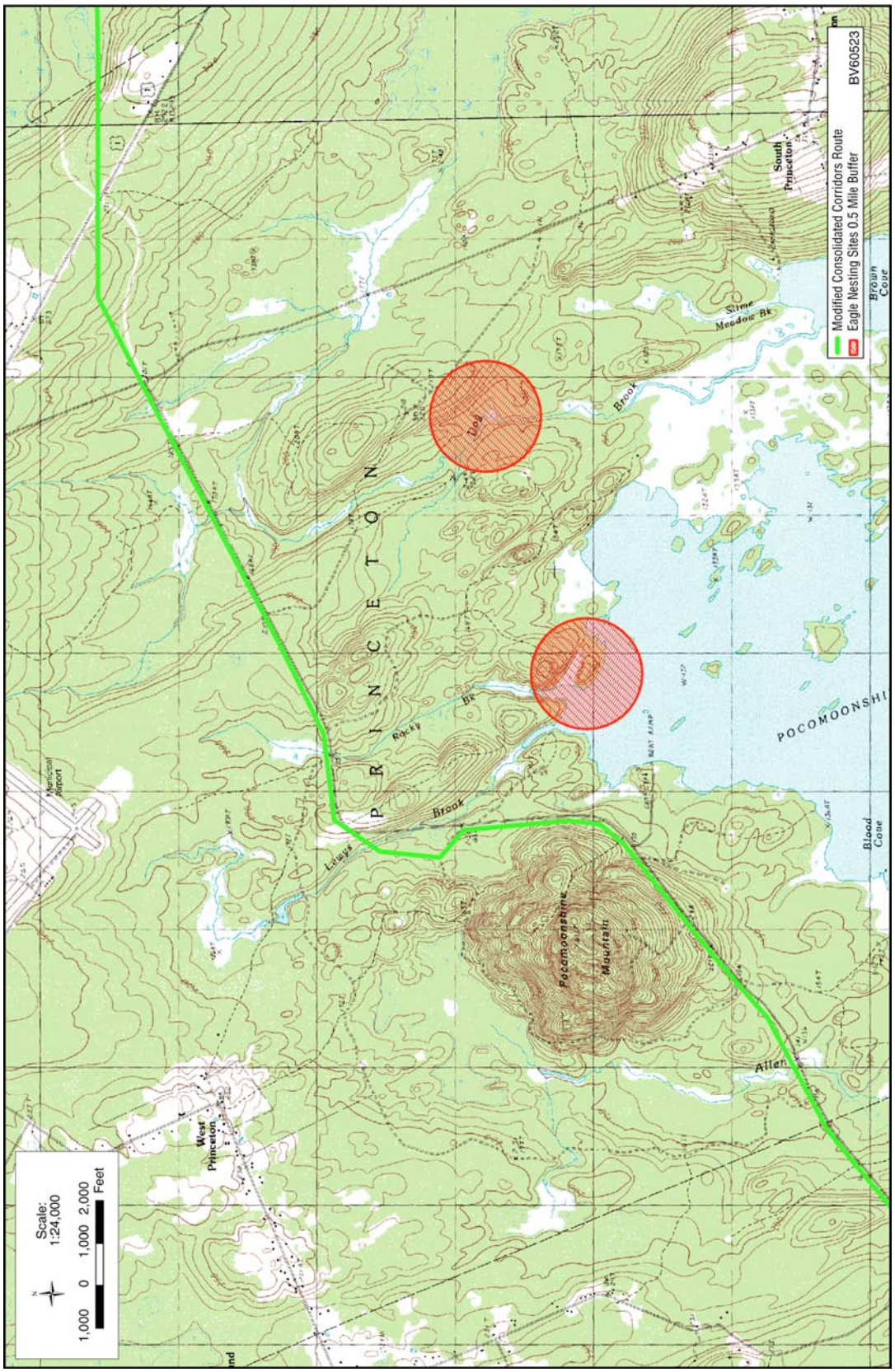

FIGURE F-4 Bald Eagle Nest Sites along Pocomoonshine Lake and Dog Brook near the Modified Consolidated Corridors Route for the Bangor Hydro-Electric Company Northeast Reliability Interconnect (Source: Paquette 2005b)

Pocomoonshine nest is more than 2,000 ft (610 m) from the NRI, while the edge of the buffer for the Dog Brook nest is about 5,600 ft (1,707 m) from the NRI. The ROW would intersect several waterfowl and wading bird habitats in the area, but Pocomoonshine Lake is the only large body of water in the area that would provide a major foraging area.

The habitat requirements of bald eagles are met in many places along the proposed route in addition to the specific nest sites described above, and it is likely that eagles forage elsewhere in the vicinity of the proposed route.

The ROW would likely be within the foraging areas for this species, particularly where the ROW would cross larger water bodies such as the Great Works Stream and the Narraguagus, Machias, and St. Croix Rivers. The applicant does not have reports of bald eagle mortality associated with the existing MEPCO 345-kV transmission line that crosses the Penobscot River at two locations. The Penobscot River provides nesting and foraging areas for a number of bald eagles. In the past, large numbers of alewives (*Alosa pseudoharengus*) in the St. Croix River attracted many bald eagles to that river for foraging. Currently, only a small number of alewives are allowed to pass upstream of the dam in Woodland, making the river in the vicinity of the proposed NRI crossing less valuable for foraging eagles (Bartlett 2004).

The potential impacts of transmission lines on bald eagles include (1) disturbance of important habitat, such as nest sites, during construction and maintenance, and (2) mortality from collisions with the conductors or shield wires. Collision with utility lines is generally a random, infrequent, and inconsequential factor for raptor populations (Olendorff and Lehman 1986). However, loss of individuals of a rare species could be of significant concern.

Most bald eagles use old forests for nesting and other activities (Stalmaster 1987). The proposed route primarily crosses commercial timberlands that are cut on a 20- to 80-year cycle (McWilliams et al. 2005). Transmission line construction activities could disturb bald eagles, but such impacts are expected to be negligible (localized and temporary). Grubb and King (1991) assessed the effects of human disturbance on breeding bald eagles and reported the following median distances that evoked response from human disturbance: 980 ft (299 m) resulted in an "awareness" or alert response, 490 ft (149 m) resulted in a short-distance flight, and 330 ft (101 m) caused departure from the immediate area of human activity. Grubb and King (1991) suggested that vehicles should be excluded within at least 1,500 ft (457 m) and restricted within 2,800 ft (853 m) of breeding eagles. Since the nearest known bald eagle nests are more than 2,900 ft (884 m) from the proposed route, no construction-related disturbance effects are expected. Several activities shown to affect eagle behavior (hunting, fishing, and ATV use) are typical activities that occur in the project area. Development of the NRI would increase access within the project area for these recreational activities, although access is already well-established throughout the project area because of existing logging roads and skidder trails, established ATV trails, and other ROWs. The NRI would not increase access to areas where eagles are known to nest or forage.

The construction and maintenance procedures for the NRI are designed to minimize environmental impacts, and BHE would review ROW maintenance activities with regard to potential resource issues (TRC 2005b). Access and activity restrictions would be determined on

the basis of knowledge of eagles in the area. Mechanical and hand clearing, coupled with selective herbicide use, would be used during construction of the NRI, while hand cutting and selective herbicides would be used during ROW maintenance. Herbicide application would be carefully controlled, and personnel who applied the herbicides would be trained and licensed and would follow manufacturers' guidelines, U.S. Environmental Agency (EPA) guidelines, and State regulations.

Bald eagles would not be electrocuted by the NRI because the distances between the conductors and between the conductors and shield wires would be greater than the wingspan of the bald eagle. However, the presence of the transmission line would present a potential collision hazard to bald eagles. Raptors are generally able to avoid obstacles because of their (1) keen eyesight; (2) ability to soar or use relatively slow, flapping flight; (3) good maneuverability while in flight; (4) conditioning to the presence of obstacles; (5) and tendency not to fly in groups. However, when preoccupied or distracted (e.g., when defending territory or pursuing prey), the potential for line strikes increases. Bad weather can also limit the visibility of wires to raptors (Olendorff and Lehman 1986).

Shield wires are often implicated in bird losses along high-voltage transmission lines because birds will fly over the more visible conductor bundles but collide with the less visible shield wires (Thompson 1978). Faanes (1987) reported that 102 of 109 bird deaths from transmission line collisions were due to the overhead shield wires rather than the conductors.

Mitigation measures for the proposed project are detailed in Section 2.4 of the EIS and are largely based on the applicant's erosion and sedimentation control plan (TRC 2005a) and post-construction vegetation maintenance plan (TRC 2005b). The mitigation measures mentioned in these plans would be highly effective in minimizing the potential for adverse environmental effects associated with the construction, operation, and maintenance of the NRI and associated ROW. Few mitigation measures directly related to the bald eagle would be necessary because construction, operation, and maintenance of the NRI would not occur close to Essential Habitat for the bald eagle. Nevertheless, the following list summarizes the types of mitigation measures that the applicant would employ to minimize potential effects to the bald eagle:

- All personnel who would be working on the ROW or be present at a construction site at any time during construction would be given some form of environmental training before being allowed access to the construction site, and they would receive refresher training each month throughout the construction period.

- During the project planning phase, all sensitive natural areas that required priority treatment would be identified, and the method of avoiding or crossing these areas to minimize impacts would be identified and incorporated into the construction-issued project plans and permitting documents, if necessary.

- Construction operations would be continually monitored and inspected to ensure they complied with the erosion and sedimentation plan as well as other

permit regulations and requirements. The combined efforts of the contractors, BHE environmental inspectors and representatives, and independent third-party inspectors would be required.

One specific mitigation measure that the applicant would perform that would directly minimize the potential effects on bald eagles would be to place colored spheres and/or flappers on the shield wires at the following water body crossings: Great Works Stream, Narraguagus River, Machias River, and St. Croix River (BHE 2005). Marking transmission lines in this manner has been shown to significantly reduce bird collisions with power lines and is also a cost-effective and logistically feasible method of reducing collisions (Morkill and Anderson 1991). DOE has reviewed BHE's proposed construction and maintenance activities and determined that the construction and maintenance of the NRI may affect, but is not likely to adversely affect, the bald eagle.

F.5-2 Atlantic Salmon (*Salmo salar*)

The Gulf of Maine DPS of the Atlantic salmon has no State listing but was Federally listed as endangered in 2000 (NMFS and USFWS 2000). A draft recovery plan for the Gulf of Maine DPS was published in 2004 (NMFS and USFWS 2004). Watersheds utilized by this population segment include the Sheepscot, Ducktrap, Narraguagus, Pleasant, Machias, East Machias, and Dennys Rivers. Atlantic salmon populations in the Kennebec River and its tributaries and the main stem of the Penobscot River were excluded from listing as part of the Gulf of Maine DPS because native populations were believed to be extirpated in the Kennebec River, and the Penobscot River has received substantial supplemental stocking of Atlantic salmon from Canadian rivers.

The NRI would cross the Narraguagus River, Machias River, and the East Machias River watersheds. Within these watersheds, the following streams that are crossed by the NRI are considered Atlantic salmon streams of special concern:[2] Narraguagus River, two tributaries to Fifth Machias Lake, a tributary to Fletcher Brook, Machias River, a tributary to Dead Stream, Lanpher Brook, Huntley Brook, and Joe Brook (Bartlett 2004; BHE 2005). The NRI would have 31 crossings of water bodies that fall within the DPS of the Atlantic salmon and 67 crossings of water bodies considered essential fish habitat (EFH). (An EFH assessment for the Atlantic salmon is provided in Appendix G of this EIS.) The NRI would not cross any Atlantic salmon spawning and rearing areas (BHE 2005). Also, AC mitigation would not be installed where the M&N gas pipeline crosses water bodies.

The following information on the life history of the Atlantic salmon has been abstracted from Atlantic Salmon Unlimited (2003), Lansky (2004), and NEFMC (1998). The Atlantic salmon spawns in late fall, with eggs hatching in early spring. Young Atlantic salmon spend 1 to 3 years in their stream rearing habitat, go to sea in spring (they may migrate as far as Greenland), and return to spawn after one to four winters at sea. Adults may spawn in more than one year, although post-spawning mortality rates are normally high. Freshwater habitat for the Atlantic salmon

[2] Atlantic salmon streams of special concern are those identified by the Maine Atlantic Salmon Commission as those being most important to the various life stages of the species.

consists of rocky runs and pools of small to large rivers. Eggs are laid in gravel-bottomed riffles in a shallow depression (redd) excavated by the female and covered with gravel. Normal egg development requires water temperatures below 50ºF (below 10ºC), with an optimum temperature of 43ºF (6.1ºC). Rearing habitat includes shallow riffle areas interrupted by pools and deeper riffles. Parr (young freshwater salmon with distinctive vertical bars) require cover such as large rocks. Adults eat fishes and crustaceans when at sea but do not feed in freshwater. Young consume primarily invertebrates.

The Atlantic salmon was nearly extirpated from New England in the 1800s because of habitat loss and degradation from dam construction and logging. The endangered status for the DPS relates to its small spawning range in the rivers, low abundance of spawning individuals, poor marine survival, habitat degradation (e.g., sedimentation and water withdrawals), diseases, and genetic impacts on native salmon from salmon raised at aquaculture facilities. The Gulf of Maine DPS is declining steadily. The number of smolts (juvenile salmon that are migrating to the sea) leaving rivers is not increasing at the same rate as parr abundance is increasing (the parr increase results from stocking hatchery-raised fry in the habitats). The estimated total returns (i.e., adults returning from the sea for spawning) in 2002 were estimated at less than 50 fish for the entire Gulf of Maine DPS.

Mitigation measures for the proposed project are detailed in Section 2.4 of the EIS and are largely based on the applicant's erosion and sedimentation control plan (TRC 2005a) and post-construction vegetation maintenance plan (TRC 2005b). These mitigation measures would be highly effective in minimizing the potential for adverse environmental effects associated with the construction, operation, and maintenance of the NRI and associated ROW. Some of the generalized mitigation measures that the applicant would undertake to minimize impacts on Atlantic salmon habitat were listed earlier for the bald eagle. The following summarizes mitigation measures that the applicant would implement that would directly or indirectly minimize potential impacts on Atlantic salmon:

- All personnel who would be working on the ROW, or present at a construction site at any time during construction, would be given some form of environmental training before being allowed access to the construction site. They would also be given refresher training on a monthly basis throughout the construction period.

- Environmentally sensitive areas where activities would be restricted or prohibited would be flagged and/or have signage posted.

- Prior to any clearing or construction work in or near sensitive natural areas, a walk-through would be conducted by the contractor, the applicant and/or designated representative, and third-party inspectors and/or other agency representatives such as Atlantic Salmon Commission and USFWS representatives. Its objectives would include, but not be limited to, the following: identify available or alternate points of access, determine appropriate operating methods to protect sensitive areas, and identify future no-access areas and buffers.

- To the extent practicable, the applicant would use existing public roads, abandoned roads, Stud Mill Road, and other smaller logging roads to access the ROW.

- Requirements for standard stream buffers and salmon stream buffers would be adhered to, including restrictions on support structure placement, soil disturbance, vehicular traffic, and vegetation clearing.

- Except for the Narraguagus and Machias River crossings, support structures would be placed as close to the salmon stream buffer as possible to minimize the amount of clearing required, thus maximizing shading (cooling) potential.

- Appropriate erosion and sediment control barriers, dewatering structures, and/or nonstructural procedures (such as mulching and seeding) would be used, as necessary, to minimize stream impacts.

- Erosion control structures would be maintained to make sure that they functioned effectively.

- As feasible, construction activities, including clearing, would be conducted during winter when the ground is frozen, and ROW preparation activities, such as clearing and excavation, would be avoided during the spring and fall (wet) seasons.

- Requirements for site restoration methods and timing following construction would be adhered to, with stream crossing areas being among the areas given the highest priority.

- No refueling or maintenance of equipment (including chain saws) would occur within stream buffers.

- Herbicides would be used in strict accordance with manufacturers' and EPA-approved labeling; would not be applied directly to water or areas where surface water was present, within stream buffers, or within 25 ft (8 m) of wetlands that had water present at the surface; and would not be mixed, transferred, or stored within 50 ft (15 m) of water bodies and wetlands.

Construction and maintenance procedures for the NRI were designed to minimize environmental impacts, and BHE would review ROW maintenance activities with regard to potential resource issues (TRC 2005b). Access and activity restrictions would be determined on the basis of knowledge about the Atlantic salmon in the area. Both mechanical and hand clearing, coupled with selective herbicide use, would be used during construction of the NRI, while only hand cutting and selective herbicide use would be used during ROW maintenance. Herbicide application would be carefully controlled, and personnel who applied the herbicides would be trained and licensed and would follow manufacturers' guidelines, EPA guidelines, and State regulations.

DOE has reviewed BHE's proposed construction and maintenance activities and determined that the construction and maintenance of the NRI may affect, but is unlikely to adversely affect, the Atlantic salmon.

F.6 CONCLUSION

The bald eagle and the Atlantic salmon, Federally listed as threatened and endangered, respectively, under the ESA, have been identified as having the potential to occur in the vicinity of the proposed transmission line ROW for the NRI (Bartlett 2004). No 0.5-mi (0.8-km) buffer zones for any bald eagle nests would be traversed by the proposed transmission line. However, the Atlantic salmon is known to inhabit several of the rivers and streams that would be crossed by the transmission line. No designated critical habitat for either species occurs within the project area. The applicant has designated, and would implement, mitigation procedures during construction, operation, and maintenance of the transmission line that would protect the listed species and their habitats.

DOE has determined that construction, operation, and maintenance of the NRI may affect, but is not likely to adversely affect, the bald eagle and the Atlantic salmon.

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